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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/769,385	01/30/2004	Tienteh Chen	200312792-1	8388

22879 7590 02/12/2007
HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER

TSOY, ELENA

ART UNIT	PAPER NUMBER
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1762

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/769,385

Applicant(s)

CHEN ET AL

Examiner

Elena Tsoy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 23-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Request for Reconsideration

Request for Reconsideration filed on December 28, 2006 has been entered. Claims 1-37 are pending in the application. Claims 23-37 are withdrawn from consideration as directed to a non-elected invention.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hirose et al (US 6,203,899) in view of Santo et al (US 5,965,252), Abe et al (US 5,372,884) and Alexander et al (US 3,007,878) for the reasons of record set forth in paragraph 2 of the Office Action mailed on 9/21/2006.

Response to Arguments

3. Applicants' arguments filed December 28, 2006 have been fully considered but they are not persuasive.

(A) Applicants maintain their arguments that a prima facie case of obviousness with respect to pending claims has not been met:

(Specifically, the references do not provide sufficient teachings or motivation to be modified or combined in order to arrive at Applicant's invention; and the combination of references is based on hindsight. Hirose teaches the treatment of silica with metal oxide or organic groups for use in a printing medium. Hirose does not teach a sequence of steps that includes cationizing the silica and modifying the cationized silica with an organosilane reagent

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as required by independent claims 1 and 15. Abe also teaches the use of cation-modified silica in ink-jet sheets by specifically referring to Alexander for the method of cationizing the silica. Alexander was filed in 1956 and outlines a basic reaction scheme for cationizing silica in an aqueous solution. However, neither Abe nor Alexander teaches the steps of cationizing silica and also modifying the cationized silica with an organosilane reagent as required by the present invention. Further, Santo uses aluminum hydrate dispersion instead of a silica dispersion as required by the present method. None of the references cited by the Examiner teach the steps of cationizing the surface of the silica and modifying the silica with an organosilane reagent).

Applicants further argue that Santo cannot be combined with Hirose because surfaces of alumina particles in Santo are not the same as silica particles in Hirose partially covered by alumina. The actual surface chemistry is well known and consists of oxygen bonding to the silicon atom as the ethoxy group leaves.

The Examiner maintains the response to the arguments: (**Hirose** teaches that silica for the use in an ink receiving layer (See column 3, lines 4-13) can be cationized by treating silica with a compound containing some of the cationic metal oxides or metal atoms such as alumina and *alumina hydrate* such as gibbsite, bayerite, nordstrandite, crystalline boehmite, diaspore and pseudoboehmite (claimed surface activating agent) (See column 3, lines 62-67; column 4, lines 3-15) or by treating silica with an organic compound having both amino group or quaternary ammonium group thereof and functional group having reactivity to a silanol group on the surface of silica, such as aminoethoxysilane (See column 4, lines 19-26) by dispersing silica in water and contacting it with the silane (See column 15, lines 23-28). Abe et al teach that a cation-modification of colloidal silica for the use in an ink receiving layer (See column 2, lines 28-34) by coating with a hydrous metal oxide such as hydrous aluminum oxide, hydrous zirconium oxide, hydrous tin oxide or the like can be carried out by the method described in US 3,007,878 to Alexander et al (See column 2, lines 41-58), e.g. by mixing aquasol of colloidal silica (dispersion of silica in water) with an aqueous solution of basic aluminum chloride (See Alexander et al, column 4, lines 9-10; column 7, lines 56-57). One of ordinary skill in the art would have *motivation and reasonable expectation of success* to cationize silica with cationic

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alumina or alumina hydrate in Hirose by mixing aquasol of colloidal silica with an aqueous solution of basic aluminum chloride. Clearly, mixing can be done by adding the aqueous solution of basic aluminum chloride to the dispersion of silica in water, which dispersion is made by claimed step of dispersing silica in water. Hirose et al in view of Abe et al and Alexander et al fail to teach that silica particles are first coated with alumina or alumina hydrate and then with the organic compound. Santo et al teach that an *alumina hydrate* surface-treated in an aqueous dispersion (See column 7, lines 52-56) with a silane coupling agent (See column 3, lines 39-44) such as gamma-aminopropyltriethoxysilane (See column 5, line 2) when used in an ink-receiving layer composition provides image formed on the ink-receiving layer with no change in tint and good color reproducibility (See column 2, lines 56-67). One of ordinary skill in the art would have *motivation and reasonable expectation of success* to have treated a coated silica in Hirose et al in view of Abe et al and Alexander et al with an organosilane reagent with the expectation of providing image formed on an ink-receiving layer with no change in tint and good color reproducibility since the coated silica in Hirose et al in view of Abe et al has and Alexander et al has the same alumina hydrate surface as in Santo et al, and Santo et al teach that surface-treatment of alumina hydrate in an aqueous dispersion with a silane coupling agent such as gamma-aminopropyltriethoxysilane when used in an ink-receiving layer composition provides image formed on the ink-receiving layer with no change in tint and good color reproducibility).

As to new argument, first of all, in contrast to Applicants assertion, *alumina hydrate* particles of Santo and *alumina hydrate* coated silica particles of Hirose have on their surface the same alumina hydrate. Secondly, it is well known in the art that the surface chemistry of bonding ethoxysilane to *any* surface having **hydroxyl** groups is the same, and consists of oxygen bonding to the surface atom as the ethoxy group leaves. Like silica, alumina and alumina hydrate have hydroxyl groups on their surfaces, and ethoxysilane bonds to their surfaces through the same surface chemistry as in silica.

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Therefore, the references cited by the Examiner teach the steps of cationizing the surface of the silica and modifying the silica with an organosilane reagent, and a prima facie case of obviousness with respect to pending claims has been met.

(B) Applicants argue that the Examiner alleges that an ordinary person skilled in the art would be motivated to make recited combination and would have a likelihood of success since the coated silica of Hirose in view of Abe and Alexander "has the same alumina hydrate surface as in Santo." See Office Action page 5. However, a close inspection of the cited references reveals that the chemical surface structure is quite different. Alexander provides a figure of the surface of its activated silica. The figure clearly shows a silica particle having an outer silicon atom surface partially bound by a basic aluminum chloride compound having the formula, $\text{Al}_3\text{O}_2(\text{OH})_2^+\text{Cl}^-$. See Figures 1 and 2. Likewise, one would expect a similar composition for Abe and Hirose, since both references teach a similar surface-activated silica particle. It is worthy to note, that the entire surface of the silica particle need not be bound. Alexander discloses "a surface coverage of about 2.4 mol percent." See col. 4, lines 54-55. The present invention requires a surface activating agent in a sufficient amount to modify the net charge of the surface from positive to negative. See page 7, lines 31-32 and page 8, lines 1-2.

The Examiner disagrees. First of all, primary reference of Hirose requires a surface activating agent in a sufficient amount to modify the net charge of the surface from positive to negative just like claimed invention. Secondly, Abe et al also form cation-modified silica, i.e. Abe also requires a surface activating agent in a sufficient amount to modify the net charge of the surface from positive. Moreover, Abe and Alexander are *secondary* references which are relied upon to show *how* to treat silica with alumina hydrate.

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Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Thursday, 9:00AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elena Tsoy
Primary Examiner
Art Unit 1762

ELENA TSOY
PRIMARY EXAMINER
ETsoy

February 9, 2007